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(54) Mechanical counter for a matering appearable

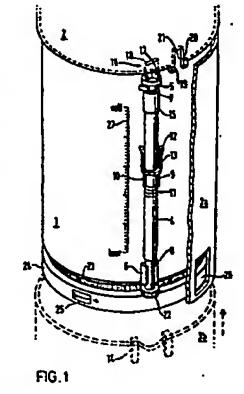
(57) Ametering apparatus for matering for example a medicument sequipes a device with which the number of metering portions is displayed. The known display devices however are not suitable for a metering appearable having two housing portions which are rotatable relative to each other. The machanical courses for a matering appearable of that kind comprises at least one spindle with rotary locking, whose axis extends in parallel reletoruble with the exis of the metartry apparatus and exchara largered in the region of the peripheral surface of the appendus. The spindle is estimatesly driven by way of a transmission assembly when the metering apparatus is actuated. The oursier of metadog postions already discharged and the number of metading posttons parmitted in total is quasi-continuously displayed by the (nechanical country. The transmission ratio of the transrelation esperably can be designed to cover a wide range. The cursor serving for deplay purposes cast be reset on the spindle. The permissible period of see of a containing appearable which can be used for a plurality of supply containers can be reliably viewed.

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epindie in a cursor with rotary excuring (prevention of retation), a actife being disposed apposite serve. [0013] According to another espect, the invention prevides a metering apparatus having two countaily erthe metaring apparatus having a machanical courtest comprising a suppreferented spirate mounted in bearing meets on one of the housing partiess to a peripheral racics thereof as that it is returned by movement of the other housing portion, and a cases movable, by the acrostoreed, relative to migrain meets, the arrangemed being such that movement of the cursor with respect to the marker means provides a measure of the number of operations of the expensive.

[0014] Preferred features of the counter and the metering apparatus will now be described.

[0015] The two housing portions are rotated relative to each other to actuate the metaring apparatus. The angle of rotary (novement may be a preferably integral fraction of 500 degrees; it is preferably 50 to 300 degrees. The relative insverned of the tree housing porthos mixture to each other is trive of and converted icts a rotary recoversest of the spindle and a stiding movement of the cursor by mappy of the transmission 🔑 expendity which comprises the took expendenters at the one end of the spindle and the at least one projection at the arise of the second bossion portion. The rotary mountings for the spindle are protectly in the form of map-action mountings. The transmission acts of the projection-type transmission assembly is found by the cumber of exclamans and the number of teeth on the pinion; that also firms the restrict of revolutions of the apinde, which corresponds to an actuation of the meterrog appearable. For each actuation of the contaring appartition the member of resolutions of the schools can be from LCCCh (one disturb) to 10. The prox of the econethread on the spindle is adapted to the number of meturing portions which can be taken burn the supply container in the chalasing apparatus, and to the travel of the carsor on the spirols. When the spinds is rotated the cursor on the opinide is displaced robbie to the scale which is disposed for exemple as the that boosing postion. The ecole is preterably Speaky disting. The postthis of the corner indicates using properties of the substance to be metered has already been taken from the energy container and what properties is call present. The direction of retation of the aspendience on the spirals in elitrer in the same direction or in the opposite direction the direction of rotation of the housing portions refathe to each other,

[D016] The cured extractively comprises a display ting, at hand one first basing a acresiment parties and al basi one forther thro with a reacting projection. There are preferably a plurality of finite and the Birbs are preferrably of a resolutions are. The accompany portion positively localityly engages into the econothecad on the spirith. The taxor can be explaced as the spin-

de for resetting thereof, by means of the resetting prejection. When the cursor is displaced the accombined portions on the mailiers little skide reciliently over the spindle acreethread without damage. The contours of ranged incusing portions which are related relative to . # . She cursor and the bousing are so enlacted that the curpositively locking engagement. For example at least one of the resetting projections may project beyond the screethreed to exch a degree that it does not pess foreuch the care between the spindle and the peripheral earthce of the first housing portion. That projection

> [0017] A recess can be provided at the other end of the spincle which is in appeals relationship to the drive portion of the spindle. As soon as the acrostimed purtions no the meliters firths have meched that recess the cursor censes to be dispisced. The recess serves as a tree-motion coases for the cursor so that demans to the cursor is provided if the admissible travel distance of the course on the enjoyie is expended upon further actuation

assives as a robusy securing means for the cursor.

of the metering apparetus. (DOLS) Preferably a cover can be fitted over the first housing portion to protect the matering apparatus and the counter. The cover is connected to the Gral toursky portion releasably in an exist direction in a precisionmined position. The cover when in the condition of being Roard in position connect resists relative to the first housing portion. Accordingly the first housing portion cars still be mitsted with respect to the second housing portion al-

though the first bossing portion is covered by the cover. [2015] The wash which is disposed appoints the coacy is provided either on the first housing portion or on the inside or the catalog of the cover. The cover is transparent in a region-wise manner or 8 comprises transper-

(DC25) At least one rigid entrafament means may be provided on the inside of the cover, which astrohomers means pushes the cursor back into the starting position thereof at the one end of the spindle by meens of the resetting projections when the cover is 10ad into place. (0021) Bestir, gebahanert meere des be provided in place of the ngld entraferous means. In this case the meeting projections of the curror can be provided with

COM BOOK (DCZZ) When the cursor is result the cursor etiats regulated as other all the case and of the aplaces before the cover reaction as end postern. The cover is further moved to its and position, in which case the shall pos-Note that is to say the replices first or the electic entranment means, springs back and the cursor and the entrainment means are uncomplet. Accordingly the cursor le in an attache poston from which it is displaced when

the spindle is record. (DC25) In a specific configuration of the country the pirition at the one and of the spende has four moth of which has oppositely disposed batch are wider than the other two tooth. Provided on the edge of the encored bounce position are two projections, between which EP 1 254 678 A2

Owner lection

[0001] The invention concerns a mechanical course for a matering apparatus for metaring powder, tiggic or gaseous autieturicus, and metering apparatus comprising such a counter. The apparatus comprises leter also two coastably arranged housing portions which are retotal relative to each other upon actuation of the apparation. The number of metading portions of the substance is counted and displayed by the counter.

(0002) As aim of the invention is to provide epithum adaptation of a counter of that land to handling of the metering apparatus in an operationally reliable strumer, and to simplify manufacture of the courter.

[0003] The Invention has been particulated thousands exclusively, developed for application to metered meeinhelers (MDRs) such as are disclosed in US Peters 5497944 (clarked from WO01/14462), the extra contests of both of which are incorporated herein by referarros. Pressure (generally at least 50 bar) is generated. If in ametered amount of Rold which is discharged through a hezzle asserbly baving one or more very erest openings e.g. in the range 25 to \$00 square micrometres. Preferred noticle assemblies are declosed in US Patent 5472143 (and parallel WO94/07807), the entire contanta of both of which are incorporated herein by reference. An emergy storage means, such as a spring, is professity manually loaded e.g. by a rotary assecuts wadge arrangement as disclosed in US Patent 4280032 and GB Peters Application 2291135, the entire contents of both of which are incorporated berein by reference, A fatching mechanism is generally provided to hold the string in the loaded position and is manually releasable TO pressuring the cretered account of fluid e.g. using a platon and cylinder arrangement. A reservoir and valve arrangement can be provided for recturging the cylindur. Further details are described in PCT/EP960431 and perallel USSN 08/726219, the entire contents of both of which are incorporated haveln by reference. (DODG) Matering apparatuses are used by example to

medical corosol therapy for dualing with aliments of the respiratory tracts. In that abustion a liquid or powder medicament is attorished to form an aerosol by means of an atomiser or settered into a stream of gas. The medicomers in contained in a supply container which is inearted into the metaring appearatus. The supply in acontainer may be sufficient for several days up to some months. It is therefore necessary to display the consumed amount of medicament or the amount of medicurrent which is still present in the container.

(DODS) PCT Patient Publication WO-05/24167 provides a display device for emedical metering apparatus. That display device comprises a ring which is retatable one cultivaries ont at tracport the distanceases factors for which, for each dose of a medicament under pressure which is taken from the metering apparetus, is automaticely recent through a predecermined angle by a wedge drive, a small postion of the ring being visible. The display device is preumstately actuated when the medcorrect is interlect.

[0006] US Peters No. 4 817 622 discloses a display device to a distarting apparatus, the display device comprising a linear or a robstable disk-Box ecode which is disposed buside the muturing device and which is moved by means of a locked wheel and a locking panel. Only a small portion of the scale is visible through a win-

[0007] PCT Peters Publication WO-8605991 describes a deplay device for a metering apparatus, which device comprises a distribute scale with sects on the pe-Aphery of the click, and is retained by mesons of a bells member. Only a small portion of the scale is visible Corcurcit, a window.

(2001) PCT Pisters Publication WO-82/08324 discloses a display device for a meaning apparatus in which the extal increment of the executy container within the housing is transmitted by means of a locking paul and noting there a chirir to elece electron a creang mow a is visible through a window,

[DOOS] In accordance with PCT Patent Publication WO-86/02275 a display device for a medical apray apparative comprises a digital mechanical counter which is advanced by the provement of the autoby container within the housing as soon as a dose of the substance is taken from the supply container. That apparatus comprises a large number of individual parts.

[0010] A display device which is accussed generalistcally or mechanically upon displacement of the supply container, which is under pressure, in the housing of the metering apparetus, is unsuitable for a metering apparatio having two housing portions which are rotatable mintive to each other and a supply container which is fixedly disposed in the metaring expensive.

(0011) Ways were therefore sought of providing a suitable mechanical counter for a metering apparatus having two housing portions which are rotatable mintheto each other.

(0012) The inventors provides according to one sepact, a mechanical counter for a treating apparatus having two coastably arranged beaming portions which are rotatible relative to each other, which includes at least one spindle, whose axis extends substantially perability the axis of the metering appearable, and which is disposed in the region of the peripheral surface of the metering appearable and which is mounted to the Brit. housing portion in the vicinity of each of the spindin ends by means of a respective rotary mounting. The spindle

ties a tooth arrangement at the and which is closest to the second housing portion. Provided at the edge of the second housing portion is at least one projection which enceases into the tooth emergement at the spindle end chains at evilater experiency galaxies out with the restaurs record other, its order to provide good running properties for the transmission assembly, the both entergement at the spindle end and the projections are preferably in the

form of an invoken tooth configuration. Disposed on the

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there is a recess in which the wider teath of the piblion can roll. That transmission assembly preferably has a transmission ratio of half a spincle revolution to bee actestions of the metaring experience, for example half e-

[D024] If a scholonal movement of for example 120 degrees of the two housing portions relative to each other is required for exhuntion of the metering apparatus there may be three projections on the second housing portion, more specifically being displaced through 120 degrees relative to each other. Furthermore in this case also the projections on the excond housing portion may be present only singly. Then the episide is further rotated only in each third actuation of the matering appendixs, elthough each actuation is counted.

(D025) The flanks of the wider teeth its on the inner or other peripheral auritace of the ancord housing portion. The spincie is therefore spinishle only when the wider teeth can engage into the opening between the projections. That rotary locking errangement always holds the coincile to the starting position which is provided at the beginning of the rottery movement.

[DDZS] A plurality of supply containers containing the substance to be metered can possibly be success fitted into the metaring apparatus and used. If the substance to be contered in for example & medicament it. crary be necessary for reasons of hygiene to limit the permitted number of matering portions with the re-unable matering apparatus. Then it is excitionally necessary to count and display the total number of metaring porture. which have already been declarged with the metaring apparatus or the total number of metering portions which are still evaluable. The above-described mechanical country can be developed in ventus were to cover Charles and continues.

[DUZ7] to a first embodiment of such a development a gase is provided on the other end of the spindle, which is opposite to the cities side. Provided at the corresponding end of the first housing portion is a coasist ring goes, profuncity with a Pange, which is treutised retaintly with respect to the first bousing portion and into which the great engages. The ring goat is also extend through a gives eagle for each revolution of the apinole.

(0025) Provided as the flange is at least one first mark. obich, after fere Dam a 360 degree rotation of the ring gear relative to the Brail hearing person and eller conexception of a supply container is disposed opposite a eacond area's which is in a fired position relative to the that housing portion. The murber of marks on the flange is exact to the continue of exactly containers which are contracted as a prophogra for the contracts, expension for for the authorators to be presented). The second mark can to disposed on the first housing portion or it can be a whether in the circum exticts is filtred costs the first beaution

[0025] The Dange can be previoud, instant of the marks, with a scrib which quasi-continuously chaptage

the total number of metering portions discharged with the metering apparatus or the total number of metering portions add evertable, for example in a window. The ring geer is extend through at most 350 degrees to display revolution to a rotary movement of 300 degrees of the - # - the machinum permissible instaring portions. For that tween the rotation of the spindle and the rotation of the dry case. That catto being structurally fixed by meets of a authorie radio between the numbers of teeth involved. [DOOD] In a second extbodyness of the development of the counter the counter includes a second spindle which may be elimiter to end arranged parallel to the first apindle and which carries a cursor which is possibly not resettable. Provided at one of the two ands of the first aphicte is a gear which engages into a gear at the corresponding and of the second spindle. Disposed appoalte the cursor on the spirate is a scale in a fixed position with respect to the first housing portion, which ecale can

be discused either on the first housing portion or on the power filted thereon, in the case of this counter the total number of metaring portions which have elevely been discharged or the total number of metering portions which are still me bids is morecented on the distincemust travel of the cursor on the second coindle.

(0001) In place of the second spindle with cursos, the arrangement may have a catabably industed roller, bit the periphery of which a helical line is drawn with an entire revolution ever the entire length of the rober. The austaces on the two sides of the helical line are murked is different ways, preferably in two colours, for example red and white or red and green, Ib this comprision the cover has a servery window which in an integ at the soller and through which a names cute of the peripheral surtace of the roller is visible. A scale can be disposed beside the window and extends over the order length of the solar. The ecole can be divided in accordance with the mexicus permeted number of matering portions or it can be childed into numbered sections according to the continuous permitted number of expply containers.

(DCD2) A first embedract of the development of the country has a succeed school which is of a similar dealers configuration to the first spinole had which in disposed at another location in the region of the perpheral surface of the contrates accounts. It is provided with a transcripsize erangement, similarly to the first spindle, but the transmission ratio is protected to the total number of perexisting matering particle. That spindle is dress by prelections at the edge of the second brasing postice, proferacly by the projections which are already read for other

dide can queque del est estere es secon procesa estada is country received because the first and exceed sonchas or butteress the first spiritle and the ring gant, the arrangement may have, because of the paint on the first spirale, a circle-coch transmission arresportest with which the cour on the exceed spirate to the day poor a Burther extend by one tooth for each strecktion of the first spinete. The exp-up rate can be from 2 to 1 to 10

ion the first spindle.

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[D034] The rotary bodding means for the spindle or the ring gear (i.e. the means for intibility unwarrand movement) may be a techniq panel or the rotary techniq manager See in the triction between the spindle and the mounting or the ring generated the consuming or in a specific con-Couration of the parts, for exemple a positively facility tooth configuration. The curser is retainedly secured on the spincle by vitue of the peathway locking continue

of the cursor. [1035] The components of the counter may consist of victimity any micratisi. They are professity made from practice material, for example by an injection managing. process. For medical purposes, physiologically history isse preterials are used such as for exemple polybeltsleasters/finishs (PST) or a compound of PST and Tafor (polyagradicoreally) and). The metadate are preferathy so selected that different metarble are against such colour, for example PST with Tellon against PST or PST egainst scryl-batachene-styrens.

[0036] The counter according to the invention can be used for ecomple in a maturing apparatus which serves as a high-precions atomism for a figuid medicament. The Road to be atomised is disposed in a pressure-less supply container which communicates with a ministrafred high-pressure generaling means with which an eardeal is generated; for details in this respect see German hald-court application (DE-OS) No. 185 38 902.5 (the enthe contents of which are incorporated barein by refarercs). The device for producing the high pressure is op- #F (0041). The Destrated counter incorporates the pregrated by meens of a spring-schuled locking streeting mechanism, the spring being stressed by rotation of two trousing partiers relative to each other, for details attantion is directed to German Initi-open application are incorporated herein by reference). The counter according to the invention is automatically advanced when the housing portions are rotated minthe to each other. [0037] A preletted embodiment of the loveration will now be described in greater detail with reference to the ... drawing (Figure 1) which shows part of a matering apparatus having a courter. In this embedment the first heusing postion is retained through 180 degrees relative to the second housing portion for extention of the metering appearance.

(DDSE) The first haveing portion t is mounted contribily promptly religious to the exceed housing portion 2. The cover his weight in constraint Thereon enciones the Orst housing portion 1 and the courser, The cover is addi-Stonelly shows in breises lines in the will drawn position. 3b. The purper of mecaned portions taken from the exppay container which is in use at the time is counted with the spindle (rotary shell) 4. The spindle 4 is sotstably mounted on the first housing porton by the two enepection mountings \$ and 6 which act as bearings. The grows 7 which eccumodates mounting 5 serves for activity thing the spiritle. The consor with display ring B to provided with two realisess broke 10 each harving a re-

eparthy acronitional engagement potten 11 and two resetting projections 12 on two fivide 13. The recess 8 is the free-motion means for the portions 11 at the end of their travel. Provided on the inside of the cover are pero antrainment moons 14 which, when the cover is the ted in position, push the carsor 8 back into the starting position at the end of the spiritle by means of the resulthe projections 12. When that happens the cursor ring 0 bears against the abstract 15 and the curser is released so described above.

(D025) Disposed at the one and of the spindle is a lowmoth pirion 16 having two (axistiv) narrow teeth 17 and two (actally) wich tests 19. The edge of the excent hexising portion carries the two projections 19 and 29 15 between which there is the opening 21. As described aboars, the teath and projections are preferably of involume shape. Disposed at the other end of the animale.

is the pear 22 which engages into the ring year 23. Provided on the fance 24 of the ring over are a plurafty of combared marks 25, of which a respective mark appoers in the window 25 in the cover \$4 situr a given cotery provement of the day own.

[DOID] The position of the cursor 8 against thertar ice in the free of the labelled scale 27 shows the #9 extriber of metading portions taken from the expoly contakes or the cumber of metaring pursons which can still the taken therefore. When the supply container is excepty a respective one of the numbered marks 25 appears in

facered features of the Invention Chrowsed above (but not the second and third "developments" discounsed above) and the discription just given should be read in conjunction with earlier discussion of these professed features. (DE-OS) No. 195 45 228.7 (the entire contents of which ## (DOC) The preferred counter according to the levertion has the tollowing advertages:

> Eis estimationly advanced when the metaring epperatus in extractant

is in non-critical in terms of tolerances and in therecharacter of even bee exteriors

the transmission can be designed to cover a wide

It displays the number of discharged metading pordone endler the number of metaring portions atD available, quasi-continuously and with an adequate degree of accuracy,

It is inexpensible and cannot be displaced by mistake when using the metering apparatus;

it can be used for a plantity of supply containers in COLUMN TO SERVICE STATE OF THE PARTY OF THE

it can be produced for a different number of materbig portions from each supply container and for a different meximum pumber of supply containers which may be used with a matering appearability

it is integrated into the metering apparatus and does not require any substantial modification thereof;

It can be produced in ministuries from and there-

fore takes up only a small amount of space; · the included parts of the counter are preferably made from plantics material which operate without fubricant at a tow level of Inction;

 no aubetances can get, into the substance to be me-. tired, from the courser;

 it comprises a small number of individual parts. which can be inexpensively produced by injection **prickups**

- It is easy to accombin;

- the counter can be rest each time a supply container is emption; as a result the starting position of the currier on the spindle is clearly established wherever a fresh augply centainer in introduced:

the combination of a spincile which courts the actus to eas gatub extension galaxies and to encine stopply container with a second spindle or with a ring gear means that the matering apparatus can be reliably used for a predatermined total number of metaring postone or for a predetechned total number - 39 at supply containers in excession. The parted of use of the metaring apparetus can be reliably re-

1. Amechanical counterfor a metaring apparatus having two country arranged tousing portions which are rotated relative to each other when the metering accounts is councied, the counter concentions

at least one spiridle with a screw Dread there-

whose side extends astistantally parallel to the exis of the metering appearable and

which is disposed in the region of the peripheral auriace of the matering apparatus and

which is prounted in the vicinity of the spindle ends with respective schery mountings on the tirst housing portion.

 6 both arrangement at the spindle and which is closest to the second housing portion,

 at least one projection at the edge of the second. thousing portion, for engaging the tooth ascompanient and rotating the spindle, a career recomble along the spindle by the

enreuthmed when the spindle rotates, and a scale which is disposed adjacent the cursor. 2. A exactionizal counter according to chief 1 having

 two rotary mountings, prefecably in the form of enep-action mountings.

3. A mechanical counter according to claim 1 or 2 her-

a pinton at the one and of the spindle, which is in the vicinity of the second housing portion and which provides the tooth estangament, and projections on a part of the periphery of the sec-

and housing portion, which engage into the pinion on a part of the rotary movement of the two housing portions retains to each other.

4. Amedianical courter econoling to chain 3 hering

- a pinion having four teeth, and two projections on the second housing portion.

5. A mechanical counter according to claim 3 banks

a pinker with lour teeth of which two oppository disposed back are wider then the other two truth, wherein a finck of the wider truth hears. against the boner peripheral systace of the secend housing portion,

two projections on the edge of the second housing postion, and

an opening between the two projections which is larger than the width of the wider teath of the

8. A mechanical counter according to any one of claim 1 to 5 having

a banemission ratio of half a spindle revolution to two actuations of the metering apparatus.

7. A mechanical counter according to any one of chairm 1 to 6 wherein

the pitch on the apindle acrowstweed is matched to the number of the metaring portions and the deplecement travel of the current.

A machanical counter according to any one of childre 1 to 7 setupuin

> the scindle has means for intribility presented provement, preferably in the form of a positively locking tooth arrangement.

S. A mechanical counter according to any one of claims 1 to 6 bining

at best one resident lists with a expendituel? engagement portion on the cursos, which acrestimed angegement portion engages into the screetweet on the spindle.

10. A mechanical courter according to claim \$ haring

a recess for receiving the econotiveed argugament portion at the other end of the spindle.

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11. A mechanical courter according to any one of claims to 10 healing

- all least one residing projection on the current.

chains 1 to 11 benies a cover over the first housing portion, which cover in connected thereto releasable in the cois direction and covers over the spinole, wherein the court is transcense in a molecules

13. A spechanical courter according to claim 12 having 19

granter or comprises transpared material.

at least one exteriment means on the health of the cover.

14. A machanical country according to any one of # claims 1 to 13 having

a geer on the other end of the spindle, and

a ring peer with resume for inchang presented provincest, protectible with a flamps, with which

the gray engages, and which is consisted countrily retained to

the first boughty portion.

15. A granted colored country according to daing 14 haylog. P

- at least one flat marking on the flarge of the stry pain, which marting, after has than 380 degree retation of the ring gear relative to the that housing posters, in disposed approach a M

-ign statistics back a de a deline grahem become

18. A machinical country according to chim 15 travitor

ative to the first beauting portion.

a second mething as the Bril housing porton,

A mindow is a come on the first howeing provides.

17. A medianical county embrding to any one of 49 CRICIO 1 to 13 feates

 a second galacte with meson for inhibiting towanted movement, which is arranged in mid-Martinity parallel relationship with the first spin-

ONL SHO . 8 Contar - which is peedily ast displaceable -

WCh ACTORS exchanges the second spindle, and a era-thath transmission assumbly compressing

If the it the constituting and if the second spirith, into which the projector wheel at the

and of the first spindle engages, and a scale which is disposed adjacent the cursor on the second spincle.

3 13. A machanical counter according to any one of

. g roler, on which a helical line is drawn with a ranchition mear the easier leavelly of the roller tend the material on the two pides of the helical line are counted to different ways, preferably col-

oursed with two colours, and a narrow transparent strip in the cover through which a strip on the peripheral surface of the roller is visitie, and possibly a some beside the transparent atrip.

19. A mechanical country according to any one of chica 1 to 13 baring

 a second spindle with means for inhibiting unseparate provisions, which is extended in statestartistly penaltel relationship with the first spin-

a cursor with rotary excusing an the second estado, and

Ca, and

a pre-tooth transmission assembly comprising

 a took empresent at the and of the secand spirals, which is object in the second bossino portion, ned

projections at the edge of the excursi houseing parton, which engage into the loots arrangement at the end of the second spinote -this problem of the bouning posture riskthen be such other.

20. A stephing apparatus having two costality arevicates beautic are stated parameter principal to each other when the metering expension is oper-NAME OF COLUMN OF STREET, STRE ical courter according to any preceding chain.

21. A creating apparents basing two constitity arexceler betaton one states enoting priested begans to each other when the melaning expension in spenacad, the matering appearance having a mechanical country comprising a screed-resided spindle departure in housing course on one of the housing postere in a perphend region thereof so that it is rotated by entergraph of the other accuracy postion, and a cureor movetile, by the economisms, estation to courtain creases, the accompanient being such that constructed of the county with respect to the startur CARDS STRAIGHT & CREATER of the Author of openallows of the account in.

22. A cutured apparatus according to Chim 21,

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wherein the current can be bettercorarily released from the acresstored for recetting.

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23. A matering appearable according to Claim 21 or 22, including means for indicating the number of times.

24. A metaring apparatus executing to Chain 21, 22 or 20 wherein this apticide exis is autostantially perwhat to the exte of exterior of the housing portions. At and the spincie has a gear thereon which cooperat a city prisude with bits on ensure after seas effect rotation of the spindle.

25. Ametering appearable according to Chairs 24 wherein the spincie is retained during only part of the reinthe rotation of the housing persons.

25. A metarling appearable executable to any one of Chairte 21-25, wherein the counter is an defined in 🔑 any one of Claims 1-19.

27. A midwing apparatus according to any one of Claims 20-28 which is a metered dose inhaler.

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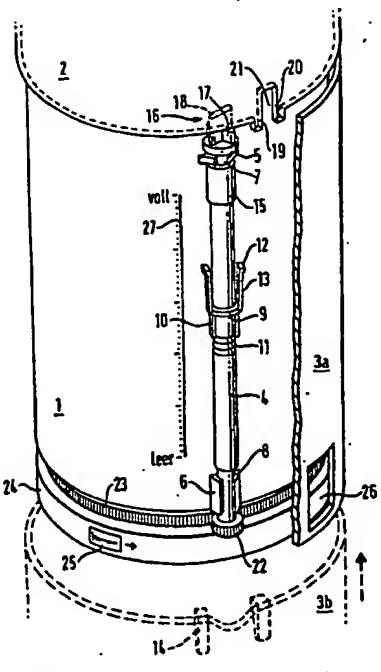


FIG.1

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